Day 3

1. A plankton sieve with a pink catch containing mostly copepods – a kind of zooplankton.

2. Mrs. Raybourn is helping to bring in the bongo nets.

3.In the wet lab, the plankton is washed out of the sieves into jars.

4. The wet lab is just off the aft deck and is where we sieve the plankton.

5. The plankton lab is where we process the chlorophyll samples

6. Mrs. Raybourn waiting for the bongo to go in the water.

Date: August 16, 2005
Time: 15.51 GMT 11:51 p.m. EDT

Latitude: 40’ 17” N
Longitude: 70’ 08” W
Wind direction: NNE (29 degrees)
Wind speed: 19.6 knots
Air temperature: 19° C
Sea water temperature: 22.8°C
Sea level pressure: 1018.1 millibars
Cloud cover: cloudy

Question of the Day: What is phytoplankton’s place in the food chain? (producer or consumer)

Yesterday’s Answer: Factors that could influence the depth to which sunlight penetrates the sea water include amount of cloud cover and how clear the water

is. If the weather is clear, more sunlight makes it through the atmosphere to the surface of the sea.
If the water is clear, the sunlight can go deeper than if the water is murky with a large mass of surface plankton, excess nutrients, pollutants, or silt.

Science and Technology Log: In yesterday's log I talked about phytoplankton. The other group of plankton is zooplankton. Phytoplankton are plants, and zooplankton are animals. If you think of the sea as a bowl of soup, the zooplankton are the chunky parts. They include organisms that spend all of their lives as plankton, as well as the baby forms of other seas animals, such as crabs, lobsters, and fish. Most zooplankton eat phytoplankton, making them the second step up the ocean food chain.

While you would need a microscope to see most phytoplankton, you can see most zooplankton with an ordinary magnifying glass. Many are big enough to see with the naked eye. While phytoplankton need to stay near the surface of the sea in order to absorb the sunlight they need for photosynthesis, zooplankton can live at any depth. Zooplankton have *structural adaptations* that help them float easily in the ocean currents. Some have feathery hairs to that can catch the current. Others have tiny floats filled with air, and still others contain oil that helps them float. There are even *behavioral adaptations* that zooplankton have developed to help them survive. One kind of snail makes a raft of air bubbles and floats on that. Some even link together and float through the ocean looking like skydivers holding hands.

Many animals go through several physical changes as they go through their life cycles. For example, a butterfly begins life as an egg, hatches into a caterpillar (larval stage), makes a chrysalis, and finally emerges as a beautiful adult. Many marine animals go through similar changes, and during their larval stage they are part of the mix of plankton in the ocean. These "temporary" zooplankton are called *meroplankton*. These include baby crabs, lobsters, clams, snails, sea stars, and squid. Permanent plankton are called *holoplankton*, and include copepods, krill, sea butterflies, and jellyfish.

One of our deck hands joked about having sushi for breakfast right after we completed a very productive plankton tow. We might not like that kind of sushi, but many ocean animals love it, and depend on it as their food source. Krill (shrimp-like zooplankton) are a very popular menu item with penguins, sea birds, fishes, squid, seals, and humpbacks and blue whales. "A single blue whale may devour up to eight tons of krill a day." (from *Sea Soup: Zooplankton* by Mary M. Cerullo)

Most of the plankton we are collecting on this cruise are zooplankton. We preserve them in jars, and when the cruise is over they will be sent to laboratories where other scientists will analyze the samples. We also analyze

water samples for chlorophyll, though, which is made by phytoplankton and is therefore an indicator of their health. In the days to come, I will describe the procedures used for the plankton collection, as well as those used for the EPA research.

Personal Log: Life on board a research vessel is not all work and no play. During down time, people rest, read, play games, watch movies, work on needlework, or get a snack, much like life at home. When I am not on watch, I write my logs, take and organize pictures, take a shower, do laundry, send email, and sleep. The scientists are usually able to eat meals together around the time we switch watches. We gather for breakfast around 5:30 a.m., for lunch around 11:30 a.m., and for dinner around 5:30 p.m. It's nice to have a chance to catch up with each other while one group comes to work and the other goes off to bed.

E-mail: scientist5.albatross@noaa.gov (during cruise) raybojbe@cps.k12.va.us (after cruise)